

## REMARKS

In the Office Action dated May 17 2006, all claims pending in the application were rejected. An objection was raised concerning claims 18 and 19 and claim 21 was questioned as lacking support in the drawings.

With this response, applicants have cancelled claim 21 and have amended claims 18 and 19. The cancellation of claim 21 is made without prejudice to reasserting this description as part of the original disclosure of this application.

Claims 1-4, 6, 7, 10, 15 and 16 are rejected on grounds of 35 USC 102 (b) as anticipated by Avnery et al. (hereinafter Avnery). For anticipation as the basis of rejection, it is necessary to find in the cited reference all aspects of the invention as set forth in the claims. This is not the case for Avnery.

In the group of rejected claims, rejected as anticipated, claim 1 is the single independent claim. Further, all other rejected claims on this basis depend from claim 1. Thus if the limitations in claim 1 are not anticipated by this reference, then it an its dependent claims are allowable.

In claim 1, there is described the electron generator of this invention. As part of this claim the generator is described as having a cylindrical shell. The cylindrical shell is further described as including a series of openings. The openings are specified in the claim as "extending around said shell". In rejecting these claims, the examiner in the recent action took the position that the openings in the reference are positioned "extending around the shell". This is not so. The openings that exist in Avnery are on one long window opening that

extends the length of one side or are positioned at the far end of the Avnery accelerator and not "...circumferentially around the shell". Avnery in discussing the prior art advises that a problem with the prior art is that maintenance of accelerators is complex and it proposes simplifying care. In this respect, Avnery teaches the replacement of the entire accelerator when the filaments or the electron beam exit window require replacement. This approach considerably reduces the need for skilled workers in vacuum technologies and/or the use of complex facilities.

In connection with the discussion of Figures 2 and 3 Avnery specifies the use of an end cap with a rectangular support plate. The support plate supports an exit window. Thus the window in these figures does not extend around the cylindrical shell. See Avnery Col., 4, Lines 16-20.

Figures 5, 7, 8, 9, 10 and 14 are all directed to filament arrangements and do not speak to the exit windows. Thus the next figure that deals with an exit for electrons is Figure 11. In this Figure, the openings are specified in the section reading "filaments 78 are parallel to the longitudinal axis A of the vacuum chamber 88 rather than perpendicular to the longitudinal axis A. In addition, exit window 82 is positioned on the outer shell 72 of the vacuum chamber 88 and is parallel to the longitudinal axis A." Col. 7, Lines 55-60. Thus this window includes openings that are in a line and do not extend around the member as is required by the instant claims. Figures 1, 4 and 5, deal with electric fields and none get into a discussion of the exit openings and/or their positions. Systems are discussed in Figures 6, 12 and 13. Figure 6 discusses a system with more than one accelerator positioned in a staggered relationship to line up the outputs laterally. This would appear to be an output at the distal

end. In Figure 12 the end cap is the output as is the case also in Figure 13 and 15. Yet in claim 1 of this invention, the generator requires a cylindrical shell and openings in the shell extending around the shell. Thus in none of these other figures or any discussion in the patent satisfies the requirement of the claim. A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention.. See for example the statement in the Manual of Patent Examination at 706.02 reading as follows: "In other words, for anticipation under **35 U.S.C. 102**, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present." (See Section headed IV.) Thus since this reference does not show each and every limitation of the claims, and since the missing elements are not inherent, the claims are allowable over this rejection. This is the case for claim 1 and since all the dependent claims rejected on this basis also include all the limitations of claim 1, all such rejected dependent claims are also allowable over this rejection.

The examiner appears to recognize that Avnery in fact does not disclose "openings extending circumferentially around the shell". This would appear to be the case in connection with the statement in the next to last paragraph on page 5 of the action where it is stated, "Avnery is silent about the openings extending circumferentially around the shell". And, there is no basis to say that this is an inherent feature. In fact if one considers Avnery's objective, he actively defocuses his beam. In Figure 11 Avnery shows filament wire as the cathode and therefore well behaved field lines to focus the beam is not possible. See also for example Avnery Col. 5, lines 27-54 where there is described use of the grid to defocus the beam. Applicants on the other hand uses focusing of

the beam to openings in the shell to cause a higher percentage of electrons to be emitted through the tube openings.

The examiner has rejected claim 23 as obvious in view of Avnery. In doing this, the examiner has determined that treating waste circumferentially is obvious to one of ordinary skill in the art. The trouble with this conclusion is that no apparatus is shown to produce an output circumferentially of electrons and no apparatus is suggested where the gas including contaminants to be treated flows around the accelerator as to result in efficient treatment of the flowing gas from a source of electrons that through focusing of the beam within the tube releases a high percentage of electrons into the gas flowing around the tube. It is this combined apparatus that results in a new invention. It is respectfully submitted that claim 23 should be found allowable.

Claims 5 and 22 are rejected on a combination of Avnery and Tornoe. Avnery has been discussed. Tornoe has to do with a segmented cathode structure. This is not the same as emitting electrons into atmosphere through the walls of an accelerator. Tornoe teaches segmenting in a vacuum environment and is more relevant to the discussion in Avnery having to do with his filaments. However, the filament arrangements in Avnery do not describe or explain electron output from a tube surface. Tornoe's cathode is designed to improve the transmission of his control grid, not transmission through the electron beam window into a different environment. The grid in the tube of the instant invention is designed to bring about 100% of the electrons emerging from its grid to image on the windows, allowing 100% transmission through the windows. And, there is nothing in either Tornoe or Avnery suggesting use of the reference with the teachings of the other reference. It is accordingly

respectfully submitted that claims 5 and 22 are allowable over this combination of references.

Claims 8, 11-14 and 20 are next stated to be unpatentable under 103(a) using a combination of Avnery and Fink. Fink appears to also deal with segmented cathodes. In this instance the cathode is a dispenser cathode. However, a segmented cathode does not result in an output from the vacuum environment of a tube to another environment and then too in a circumferential way. Also by using the segmented cathode of Fink in the Avnery device would not create a circumferential output of electrons from the outer shell of Avnery. Nor would it create the efficiency of the tube disclosed in this application. The claims are allowable over the combination of these references.

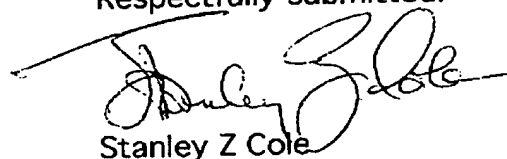
The examiner next rejects claim 9 on a combination of Rho with Avnery. Rho is used to show use of oxide cathodes in tubes. In fact Rho describes use of such cathodes in diodes, triodes and tetrodes. This does not result in a showing that a circumferential output beam can be created from a tube. Claim 9 should be allowable over this combination of references.

Claims 17 and 18 are rejected using the combination of Avnery and Skillicorn. The teaching in Skillicorn to use a vacuum pump attached to the tube to bring the tube to desired vacuum levels is a common practice in this art. However, claims 17 and 18 are dependent claims. As such they include all the limitations in the claims on which they depend. Since this is the case, it is common practice to include dependent claims that further define the apparatus of the invention even though elements of these dependent claims can be found in the art. Claims 17 and 18 should also be found allowable.

Finally claim 19 is rejected combining Avnery and Turner. As in the case of the rejection of claim 17 and 18, even though elements of the claim can be found in the prior art, the combination of the claim including the elements found in the claims on which the claim depends distinguish and set apart the invention of this application and accordingly claim 19 should also be held patentable over this rejection.

The pending claims are neither anticipated; nor are they obvious. The primary reference used in the rejection has different objectives driving its construction and operation. In fact the claims define a novel invention. They are proper in form and describe in substance an inventive contribution. Accordingly, a Notice of Allowance is respectfully solicited.

Respectfully submitted.



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